

USSR State Committee on Inventions and  
Discoveries

## PATENT CLAIM DESCRIPTION

(21) 3570386/28-13

(22) 30.03.83

(46) 15.08.84, bulletin No. 30

(72) A.A. Korzh, S.D. Shevchenko, N.I. Khvisyuk, G.Kh. Gruntovskiy, Ye.M. Makovoz, I.B. Timchenko, A.G. Golukhova, and V.A. Kutsenko

(71) Prof. M.I. Sitenko Kharkov Scientific Research Institute of Orthopedics and Traumatology

(53) 615.472.616.711-089.843(088.8)

(54)(57) A VERTEBRAL COLUMN IMMOBILIZATION LOCK which consists of a support with restraining elements *is characterized in that* in order to enable correction and stable immobilization of the vertebrae by preventing their rotation in the frontal and sagittal planes, the support is designed as a wedge and is supplied with a connecting serrated lamella.

This invention is in the area of medicine, particularly orthopedics and traumatology, and can be used for surgically correcting deformities and stabilizing the intervertebral joints in the cases of scoliosis, cyphosis, osteochondrosis, and other vertebrae disease.

A vertebral column immobilization lock is known; it contains a parallelepiped-shaped support equipped with immobilizing elements shaped as parabolic protrusions with cutting edges sloping at an angle to the parallelepiped's longitudinal axis.

Yet the aforementioned device cannot correct such deformities as angular misalignments of the bodies of adjacent vertebrae that are typical of scoliosis, cyphosis, and osteochondrosis of the vertebral column. This is due to the fact that the device is designed as a parallelepiped. Furthermore, due to certain design features of the resetting and stabilizing elements, the device can effectively resist only shear loads in the sagittal plane but has no stabilizing effect against the torque action that rotates the vertebrae in the frontal and sagittal planes, i.e., cannot ensure fully immobilized contact between vertebrae in an arthrodesis motion.

The invention objective is to enable correction and stable immobilization of the vertebrae by means of preventing rotation in the frontal and sagittal planes.

The above objective is achieved by designing the vertebrae immobilization restraint support as a wedge equipped with a serrated connecting lamella.

Figure 1 depicts a general view of the device; figure 2—the intervertebral space after installation of the lock (front-to-back projection); figure 3 shows the intervertebral space after installation of the lock (side view).

The vertebral column immobilization lock has intervertebral wedge-shaped support 1 whose load-bearing surfaces have stabilizing "herringbone" elements 2 equipped with connecting lamella 3 made as a channel whose flanges have serrated cutting edges with teeth 4. The flanges of connecting plate 3 have holes 5 to allow bone tissue grow through them.

The use of the proposed vertebral column correcting lock is demonstrated using the specific example of radical treatment of a patient with a cyphoscoliotic deformity of the intervertebral joint between the fourth and fifth lumbar vertebrae.

While in the operating room, the patient lying on his back is intubated and given endotracheal anesthesia. Using conventional femoroinguinal retroperitoneal access method, the anterior section of the fourth lumbar intervertebral disk and the body of the fourth and fifth lumbar vertebrae are exposed. The pulpal nucleus tissue and inner sections of fibrous ring of the fourth intervertebral disk are removed but without exsection of the elastic plates. To facilitate subsequent immobilizing lock installation, transverse incisions are made in the cortical layer of adjacent vertebrae at a distance from the body edge which corresponds to the distance from the load-bearing surface of the immobilizing lock to the connecting lamella flange.

Then the immobilizing lock is inserted into the intervertebral space using a hammer and an impactor, thus changing the mutual position of adjacent vertebrae into the position that corresponds to the mutual position of the load-bearing surfaces and the height ratio of the anterior and posterior sections of the intervertebral support. Insertion of connecting lamella 3 into the vertebrae body forms secure linkage between the immobilization lock and adjacent vertebrae.

Thus, the innovative design features (wedge-shaped intervertebral support and channel-shaped connecting element) of the proposed correcting immobilization lock ensure optimum anatomic alignment of the adjacent vertebrae bodies while simultaneously stabilizing the arthrodesic segment. Ceramic materials may be used for making the immobilization lock. Thirteen correcting immobilization locks have been fabricated at the institute; they have passed experimental testing and will be used when indicated.

BOKO/ ★ P31 85-183939/22 ★ SU 1124-960-A  
Endo-osseus analysing puncture instrument - comprises first  
needle holding second needle, with serrated cutting edge on  
working end and cannula on the other

BOKOV NF 19.02.80-SU-868097

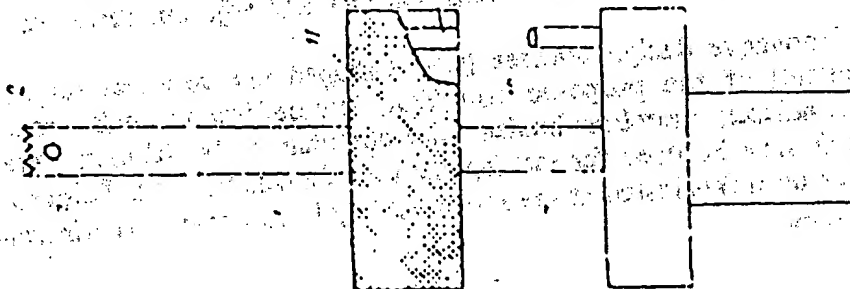
(23.11.84) A61b-17/34

19.02.80 as 888097 (1462AS)

The instrument has two cylindrical tubular needles (1,2) each with serrated working end and cannula on the other end. The second needle (4) is positioned inside the first needle (2). The splices of the serrations of the needles (1,4) are positioned in the same plane perpendicular to the longitudinal axis. The outline of the serrations of needle (4) is similar to the outline of the serrations of needle (1). The first needle (1) has two coaxial side apertures (7) in its working end, and the working end of second needle (4) has two grooves opposite each other. Outer needle (1) has an aperture (9) and inner needle (4) a pin (10) for the mutual fixation of needles (1,4).

USE - To take a bone marrow bio-optate and perform interosseous diagnosis and introduce medicinal substances using the same instrument. Bul.43/23.11.84 (3pp Dwg.No.1/2)

N85-100571



**THIS PAGE BLANK (USPTO)**

SEIS = \*

P31

86-296893/45

\*SU 1217-374-A

Endoscopic knife - equipped with stop, and having shaped cutting edge made as teeth or spiral positioned at angle to axis

SEISMOLOGY INST(CLIN = ) 03.02.84-SU-698949

(15.03.86) A61b-17/32

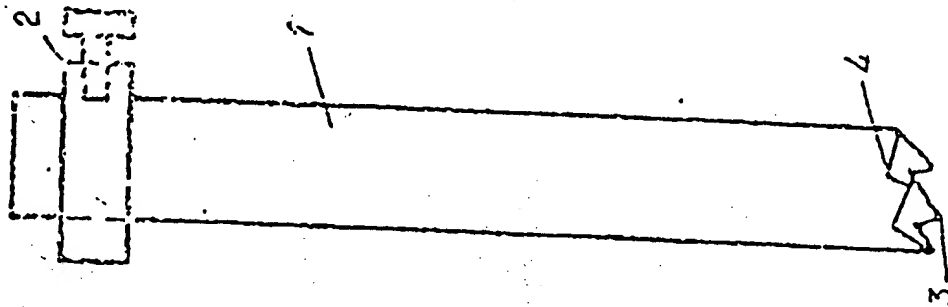
03.02.84 as 698949 (1549MB)

The proposed knife is equipped with stop (2). The cutting edge is at an angle to the axis, and is designed shaped. It is designed in the form of unequal-sided teeth (3), with the cutting edges on long side (4), in the form of a curvilinear spiral.

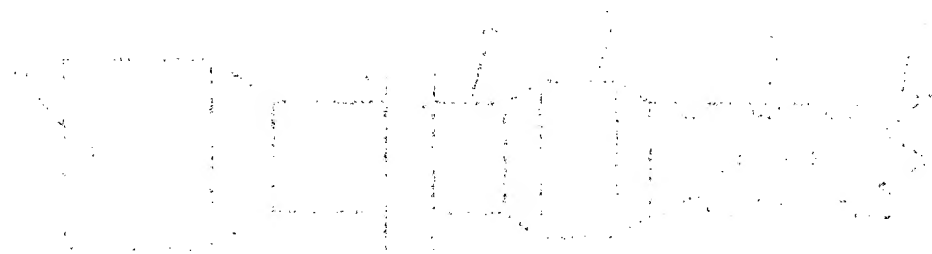
The knife is put onto the viewing hood of a bronchoscope, and is moved forward. The depth of penetration of the knife is controlled by stop (2). The scar excrescences are cut off with the cutting edge. Stop (2) allows the centring of the knife in the lumen of the hollow organ.

USE/ADVANTAGE - For removing neoplasms from tubular organs. Reduces traumaticity with circular resection of the tissues on the internal walls of internal organs by enabling visual control through bronchoscope. Bul.10/15.3.86 (2pp Dwg.No.1/2)

N86-221741



**THIS PAGE BLANK (USPTO)**



BOGO/ ★ P31 P34 86-324157/49 ★SU 1222-254-A  
Intra-osseous infusion needle - featuring tube cutting part as re-  
curved teeth, and middle tube part with thickening

BOGOSYAN A B 09.11.83-SU-660510

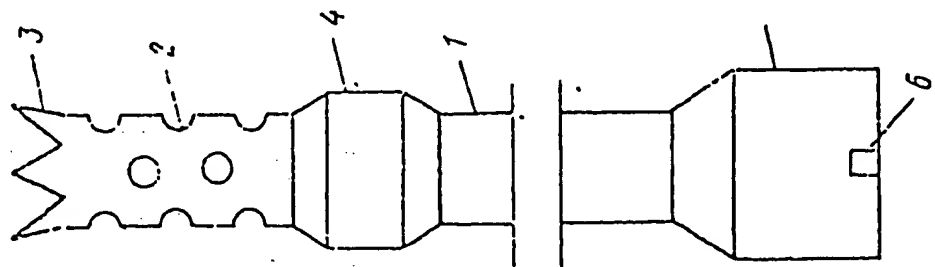
(07.04.86) A61b-17/16 A61m-05/32

09.11.83 as 660510 (1549MB)

The cutting part of tube (1) of the proposed needle is designed in the form of teeth (3), recurved from the longitudinal axis. The middle part of tube (1) has thickening (4). The dia. of the thickening (4) is greater than the dia. of the cutting part.

The bone is trephined with the operative end of the needle. When moving the needle farther, the pointed end of the mandrin cracks and moves apart the osseous structures. Teeth (3) grind the structures, forming bone chips. The thickening (4) collects the chips in front and fills the gap between the bone and the thickening. The infused liquid accumulates around the needle and penetrates to the little damaged interosseous spaces.

ADVANTAGE - Preserves the bone chips in the osseous channel.  
Bul.13/7.4.86 (2pp Dwg.No.1/1)  
N86-241623



**THIS PAGE BLANK (USPTO)**